

ENDANGERED SPECIES

Technical Bulletin

U.S. Department of the Interior
Fish and Wildlife Service

Ten Species Proposed During April for Listing Protection



photo © Ted Bailey

Sockeye salmon, once found in abundance in Idaho's Redfish Lake, have virtually disappeared. These sockeye are spawning in Alaska's Kenai National Wildlife Refuge.

Two fishes and seven plants were proposed by the Fish and Wildlife Service during April 1991 for listing as Threatened or Endangered species. The National Marine Fisheries Service also proposed one salmon population for listing as Endangered. If the listings are made final, Endangered Species Act protection will be available to the following:

Snake River Sockeye Salmon *(Oncorhynchus nerka)*

For millennia, sockeye salmon have returned in the spring from the Pacific Ocean to the Columbia River, swum upstream to the Snake River, and made their way up to Redfish Lake and small tributaries in Idaho's Rocky Mountains to spawn. On their epic

journey, these fish travel almost 900 miles (1,550 kilometers) to an elevation of 6,500 feet (1,200 meters) above sea level. No other sockeye salmon stock in the world swims as far or reaches such heights. At one time, the sockeye were so abundant that Native Americans and early miners depended on them for food. Redfish Lake derives its name from the spawning colors of these fish.

But now the Snake River sockeye salmon, like many of the Columbia River salmon stocks, is in serious trouble. Last year, no Snake River sockeye salmon were known to have succeeded in reaching the spawning areas, and in the preceding 2 years only two redds (salmon nests) were found. In 1990, the National Marine Fisheries Service (NMFS), an agency

of the U.S. Department of Commerce, initiated a status review of the Snake River sockeye salmon stock. NMFS has Endangered Species Act responsibility for most marine life, including salmon.

Soon after initiating the review, NMFS received a petition from the Shoshone-Bannock Tribes of the Fort Hall Indian Reservation to list the Snake River sockeye salmon as Endangered. After reviewing all available scientific information, NMFS published a notice in the April 5, 1991, *Federal Register* proposing that the Snake River sockeye salmon be listed as Endangered. In making the proposal, NMFS found that this stock is a distinct population and thus qualifies as a "species" as defined by the Endangered Species Act.

The Snake River sockeye salmon is one of three remaining stocks of sockeye salmon in the Columbia River system. Historically, Snake River sockeye salmon spawned in Idaho's Sawtooth Range in a region known as the Stanley Basin, which included Alturas, Pettit, Redfish, Yellowbelly and Stanley Lakes, and perhaps several other lakes. In 1881, prospectors at Alturas Lake, near Redfish Lake, were able to catch 2,600 pounds (1,180 kilograms) of sockeye salmon. However, the construction of dams, diversions of water for agricultural use, use of piscicides (chemicals used to kill fish), and operation of migration barriers (i.e., weirs) prevented salmon from spawning in or near these lakes by the late 1960's. Only Redfish Lake

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Regional News

Regional endangered species staffers have reported the following news:

Region 1 - Recent analyses of grain collected in Stephens' kangaroo rat

(*Dipodomys stephensi*) habitat by Fish and Wildlife Service personnel verified the presence of strychnine. Surface use of this rodenticide is prohib-

ited by Federal and State law. A red-tailed hawk (*Buteo jamaicensis*) found dead near the grain was positively diagnosed as strychnine-poisoned. The Fish and Wildlife Service's Gardena, California, law enforcement office is currently investigating the case.

* * *

In April, the Fish and Wildlife Service released new guidelines for areas in which proposed activities may affect the Threatened northern spotted owl (*Strix occidentalis caurina*). These guidelines had extensive peer-review by biologists, other scientists, managers from Federal and State agencies, and private interests who work on various issues pertinent to the ecology and management of northern spotted owls.

The Service recommends that owl surveys in areas slated for timber harvest or other activities be undertaken between March 15 and August 31, when spotted owls are more active in defending their established territories during the nesting season and can be counted. The guidelines outline procedures by which owls can be "called" to determine whether or not they are present in particular areas, and they recommend procedures for determining whether owl pairs are actively nesting and rearing young. The guidelines should not only assist landowners in adequately assessing their areas for the presence of spotted owls, but also ensure a high probability of identifying spotted owls and owl territories that may be affected by proposed activities.

Copies of "Guidelines for Surveying Proposed Management Activities That May Impact Northern Spotted Owls" are available from the Service's Portland, Oregon (503/231-6179), Olympia, Washington (206/753-9440), and Sacramento, California (916/978-4866), offices.

* * *

In March, staff from the Service's Olympia Field Office supported the Washington Department of Wildlife

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U.S. Fish and Wildlife Service Regions

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Federal and State Endangered Species Expenditures in Fiscal Year 1990

The Fish and Wildlife Service has published its second annual report for Congress summarizing "reasonably identifiable" species-by-species expenditures by Federal agencies and States. Under Section 18 of the Endangered Species Act, Congress requested information on expenditures to assess claims that a disproportionate effort is being made to conserve a few, highly visible species at the expense of numerous, less well-known species that may have greater need for protection. As with the 1989 report, which was summarized in *Bulletin* Vol. XV, No. 4, many Federal agencies assisted in providing expenditures data for the 1990 report. The International Association of Fish and Wildlife Agencies again compiled the data on total State expenditures.

Federal and State Expenditures in 1990

More than \$102.3 million was reported as being spent in fiscal year 1990 by Federal and State agencies specifically for the conservation of 477 Threatened and Endangered species – about 81 percent of all the listed animals and plants in the United States. The Fish and Wildlife Service accounted for \$35 million of the total expenditures, while 12 other Federal agencies (e.g., Bureau of Land Management, U.S. Forest Service, National Park Service, National Marine Fisheries Service) accounted for over \$61 million. State agency expenditures are included in the report because those that have cooperative agreements with the Fish and Wildlife Service are eligible for Federal funds under Section 6 of the Act. The States reported a total of about \$6 million.

The range of expenditures varied from a high of over \$9 million for the northern spotted owl (*Strix occidentalis caurina*) to a low of \$100 for the Lee pincushion cactus (*Coryphantha sneedii*

var. *leei*). Fifty-eight species (10 percent of the list) accounted for 90 percent of all reported expenditures. Twenty-four species had reported expenditures exceeding \$1 million each, accounting for over half of the total. The 10 species with the highest reported expenditures in fiscal year 1990 were: northern spotted owl (\$9.7 million); least Bell's vireo (*Vireo bellii pusillus*; \$9.2 million); grizzly bear (*Ursus arctos*; \$5.9 million); red-cockaded woodpecker (*Picoides borealis*; \$5.2 million); Florida panther (*Felis concolor coryi*; \$4.1 million); Mojave population of the desert tortoise (*Gopherus agassizii*; \$4.1 million); bald eagle (*Haliaeetus leucocephalus*; \$3.5 million); ocelot (*Felis pardalis*; \$3 million); jaguarundi (*Felis yagouaroundi*; \$2.9 million); and American peregrine falcon (*Falco peregrinus anatum*; \$2.9 million). The Threatened valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) was the highest ranked invertebrate in reported expenditures (#26 at \$952,000) and the Threatened northern wild monkshood (*Aconitum noveboracense*) was the highest ranked plant (#57 at \$226,000).

Report Limitations

The 1990 report benefited greatly from better accounting and reporting from the agencies compared to the 1989 report. Thus, it cannot be directly compared with the 1989 report. Although it appears that expenditures more than doubled between 1989 and 1990, the Service estimates that almost all of the increase is from better reporting by the various agencies and not from any significant increase in spending on Endangered and Threatened species. This year's report includes land acquisitions that were made to protect listed species; such purchases were not always included in the previous report. These Federal expenditures greatly inflated the

amounts reported for many species and appear to constitute about one-quarter of the total amount. Many of the significant changes in spending rank between 1989 and 1990 are a result of land acquisitions (e.g., jaguarundi and ocelot).

Like the 1989 report, the information presented in the 1990 report does not reflect the total National effort to conserve Threatened and Endangered species. A significant portion of Threatened and Endangered species conservation activities includes law enforcement, consultation, recovery coordination, and other actions that cannot be easily or reasonably identified by species. Accounting procedures by all agencies for most staff salaries, operations, maintenance, and other support services are not recorded by species. Also, there is significant variability among the various Federal and State agency reports. Finally, the 1990 expenditures report does not include the extensive monetary contributions and time that individuals, corporations, and private groups have provided for conserving listed species.

It should also be noted that annual variations in the amounts reported on individual species may reflect high cost expenditures that are not normally a part of ongoing conservation efforts. For example, the Bureau of Reclamation undertook a major land acquisition effort in 1989 to conserve the Endangered Tumamoc globe-berry (*Tumamoca macdougalii*). As a result, in 1989 this species was ranked ninth out of 554 species in expenditures (\$1,167,300). In the 1990 report, however, the plant had a rank of 60th out of 591 species, with a total of \$214,440.

Copies of the 1990 expenditures report are available from the Publications Unit, U.S. Fish and Wildlife Service, Room 130-ARLSQ, Washington, D.C. 20240.

Research Center Analyzes Health Problems of Endangered Species

Ron Windingstad
National Wildlife Health Research Center

Each year, wildlife managers across the United States are confronted with animals that are sick or dead from a variety of causes. Such health problems assume a special importance when the species are already Threatened or Endangered. Diseases, including environmental contaminant poisoning, can reduce the health, genetic variability, and reproductive potential of animal populations, and even push rare species over the edge into extinction. Minimizing such wildlife losses requires immediate and effective technical support to field personnel who find sick and dead animals; timely and accurate diagnoses of the causes; research on ways to control and treat diseases; and the cooperation and coordination of experts working throughout the country on the science of wildlife diseases.

Established in 1975, the Fish and Wildlife Service's National Wildlife Health Research Center in Madison, Wisconsin, has been working on a variety of wildlife health problems. The Center's staff of over 50 scientists and support personnel offer a variety of services, ranging from diagnostic examinations to training of senior veterinary students, wildlife biologists, and foreign scientists interested in wildlife diseases. The Center's physical facilities, including necropsy facilities and bacteriology, chemistry, microbiology, virology, and parasitology labs, are the most advanced in the world for the study of wildlife disease. A "tight" isolation wing in the Center's research building is available for working on highly contagious diseases. In addition to its primary role in preventing and controlling wildlife diseases, since 1983 the Center has been restoring 15 acres (6 hectares) of tall-grass prairie on the Center's 23-acre (9-ha) site.

Health Problems in Endangered Species

As part of its mission, the Center monitors the causes of illness and death in Threatened and Endangered species and responds to early warnings of health problems. The staff specialists identify recurring causes of mortality, new and emerging diseases, and potential catastrophic losses from established pathogens. From October 1988 through 1990, Center personnel examined more than 1,900 specimens of a wide variety of Endangered and Threatened wildlife throughout the country (see table). The Center's diagnostic findings are directly applicable to the protection and management of rare species.

One example of the Center's work involves the study of avian tuberculosis in whooping cranes (*Grus americana*) and tumors in Mississippi sandhill cranes (*Grus canadensis pulla*). Avian tuberculosis is an infectious dis-

ease in birds that can be fatal. It is caused by the bacterium *Mycobacterium avium*, which can persist for at least 2 years in soils contaminated by infected birds. Avian tuberculosis has been confirmed in 5 (and suspected in 2) of 22 whooping cranes carcasses sent to the Center from the Gray's Lake foster parent flock (16) and the Wood Buffalo/Aransas population (6). The prevalence of avian tuberculosis in these birds was much higher than the reported 0.3 to 0.7 percent typical for free-living birds. Researchers at the Center are seeking an understanding of the epizootiology, or natural history, of avian tuberculosis in these flocks. With this information, the crane populations can be managed to control losses.

Tumors of unknown etiology, or cause, have been found in carcasses of 5 of 18 Mississippi sandhill cranes from the Mississippi Sandhill Crane National Wildlife Refuge in southern



Dr. Nancy Thomas, Endangered Species Disease Specialist, begins a necropsy on a red wolf (*Canis rufus*). She is assisted by technician Mike Coffey.

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Mississippi. This prevalence is also in excess of the normal rate of less than one percent for birds in the wild. Viruses, mycotoxins (toxins produced by mold), parasites, and a wide array of environmental contaminants cause tumors and are being evaluated for their role in the high incidence of tumors among birds from the Mississippi Sandhill Crane Refuge.

The Service's decision to capture and confine the remaining California condors (*Gymnogyps californianus*) in a protected environment was greatly influenced by the diagnosis of lead poisoning in the carcasses of the last three free-flying condors. Elevated levels of lead in golden eagle (*Aquila chrysaetos*) carcasses in the California condor's habitat confirmed the potential danger of lead poisoning from a prey population similar to that of the remaining condors.

Efforts to restore Threatened and Endangered species often involve the reintroduction of captive-reared animals into parts of their historical range. For such efforts to be successful, healthy captive animals must survive in the wild at least until they have produced viable young. After the reintroduction of the red wolf (*Canis rufus*) to a portion of its former range in eastern North Carolina, Dr. Nancy Thomas, the Center's endangered species pathologist, conducted meticulous necropsies of individuals that died after release. She and her colleagues in virology, microbiology, parasitology, and analytical chemistry sought to identify the causes of death and contributing factors to help guide managers in the recovery of this species.

The Resource Health Team

Investigations of mortality in endangered species are usually carried out by the Center's Resource Health Team. For example, between October and December 1987, an estimated 350 dead California brown pelicans

Endangered and Threatened species from which carcasses (755) or tissue samples (1216) were submitted for diagnostic work at the National Wildlife Health Research Center from October 1988 through December 1990.**

BIRDS

Aleutian Canada goose	(<i>Branta canadensis leucopareia</i>)
Andean condor	(<i>Vultur gryphus</i>)
Bald eagle	(<i>Haliaeetus leucocephalus</i>)
Black-necked crane	(<i>Grus nigricollis</i>)
Brown pelican	(<i>Pelecanus occidentalis</i>)
California least tern	(<i>Sterna antillarum browni</i>)
Hawaiian coot	(<i>Fulica americana alai</i>)
Hawaiian crow	(<i>Corvus hawaiiensis</i>)
Hawaiian dark-rumped petrel	(<i>Pterodroma phaeopygia sandwichensis</i>)
Hawaiian duck	(<i>Anas wyvilliana</i>)
Hawaiian goose	(<i>Nesochen sandvicensis</i>)
Hawaiian stilt	(<i>Himantopus mexicanus knudseni</i>)
Hooded crane	(<i>Grus monacha</i>)
Interior least tern	(<i>Sterna antillarum athalassos</i>)
Japanese crane	(<i>Grus japonensis</i>)
Kirtland's warbler	(<i>Dendroica kirtlandii</i>)
Laysan duck	(<i>Anas laysanensis</i>)
Laysan finch	(<i>Telespyza cantans</i>)
Masked bobwhite	(<i>Colinus virginianus ridgwayi</i>)
Mississippi sandhill crane	(<i>Grus canadensis pulla</i>)
Peregrine falcon	(<i>Falco peregrinus</i>)
Piping plover	(<i>Charadrius melodus</i>)
Puerto Rican parrot	(<i>Amazona vittata</i>)
Northern spotted owl	(<i>Strix occidentalis caurina</i>)
Red-cockaded woodpecker	(<i>Picoides borealis</i>)
Siberian white crane	(<i>Grus leucogeranus</i>)
White-naped crane	(<i>Grus vipio</i>)
Whooping crane	(<i>Grus americana</i>)
Wood stork	(<i>Mycteria americana</i>)

MAMMALS

Delmarva Peninsula fox squirrel	(<i>Sciurus niger cinereus</i>)
Gray wolf	(<i>Canis lupus</i>)
Hawaiian hoary bat	(<i>Lasiurus cinereus semotus</i>)
Mount Graham red squirrel	(<i>Tamiasciurus hudsonicus grahamensis</i>)
Red wolf	(<i>Canis rufus</i>)
San Joaquin kit fox	(<i>Vulpes macrotis mutica</i>)
Southern sea otter	(<i>Enhydra lutris nereis</i>)

** tissue samples and organs other than intact carcasses

(*Pelecanus occidentalis*) were found scattered around Monterey Bay and San Luis Obispo Bay. The team, along with biologists from the Califor-

nia Fish and Wildlife Investigations Laboratory in Rancho Cordova and the University of California-Davis, in-

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vestigated the deaths. With support from the Center's diagnostic section, the disease erysipelas, caused by the bacterium *Erysipelothrix rhusiopathiae*, was identified as the cause of death. Pelicans were feeding on parts of fish that were discarded by restaurants and commercial fisherman near the wharfs. This bacterium is common in dead fish. Live pelicans infected with the bacterium were treated with antibiotics, dead birds were collected and incinerated, and the practice of discarding fish remains where pelicans fed was halted.

Cooperation among Center personnel, scientists from other agencies, and law enforcement agents is paramount in conducting investigations into the intentional killing of endangered spe-

cies and other wildlife. Rapid, accurate determination of perpetrators can reduce additional losses of Endangered species. For example, in early 1990, a bald eagle (*Haliaeetus leucocephalus*), three golden eagles, and a coyote (*Canis latrans*) were found dead from poisoning in New Mexico. In order to obtain a warrant to search the ranch where the alleged poisoning occurred, the Service's special agent investigating the case needed justification.

The bald and golden eagles were submitted to the Center on February 7, 1990, and within 2 days the carcasses were necropsied, assays of appropriate brain enzyme activity were completed, and a provisional diagnosis of carbamate poisoning was relayed to law enforcement agents. On February 12, the search warrant was served and

evidence was obtained from the ranch where the carcasses had been found. The Patuxent Analytical Control Facility, part of the Patuxent Wildlife Research Center in Laurel, Maryland, identified carbofuran, a carbamate pesticide, in stomach contents of the birds, confirming the diagnosis of carbamate poisoning. The evidence obtained with the search warrant was used to prosecute the rancher who poisoned the animals.

* * *

For more information on the Center's activities and specific questions on the mortality of Threatened or Endangered species, contact Ron Windingstad or Dr. Nancy Thomas at the National Wildlife Health Research Center, 6006 Schroeder Rd., Madison, Wisconsin 53711 (telephone: 608/271-4640 or FTS 364-5411).

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continued to support a run—the world's southernmost natural sockeye salmon population. However, the viability of this stock is now uncertain due to the apparent lack of fish returning from the ocean for the past several years. Because of the sockeye's 4- to 5-year spawning cycle, biologists will not know until 1994 if the Snake River sockeye still exists.

Historically, Snake River sockeye salmon entered the Columbia River primarily during June and July. The peak of the run used to reach Redfish Lake in August, and spawning occurred near shoals along the lake's shoreline, primarily in October. After hatching the following spring, the juvenile fish remained in the lake up to 2 years before migrating to the ocean. The fish usually spent 2 years in the ocean and returned to spawn in their fourth or fifth year of life. Only about 1 percent of the salmon that migrated from the lake survived natural forces (e.g., predators, disease) and human-caused environmental changes, and made it back to spawn.

The construction and operation of dams is the primary cause for the decline of the Snake River sockeye salmon. The first dam that seriously impeded access of salmon to the Stanley Basin lakes, the Sunbeam Dam, was built in 1910. Between 1938 and 1975, eight major Federal hydroelectric dams were built on the Columbia and Snake Rivers, including the Bonneville, McNary, and Lower Granite Dams. Although the specific effects of the dams on the Snake River sockeye salmon run are not quantified, the Northwest Power Planning Council estimates that the hydropower dams reduced overall annual salmon and steelhead (*Oncorhynchus gairdneri*) production in the Columbia River Basin by 8 million fish—a 50 percent decline. Approximately half of the losses were due to the blockage of habitat by the Chief Joseph Dam on the upper Columbia River and the Hells Canyon Dam on the Snake River. The other losses are attributed to the eight mainstem dams below the Chief Joseph and Hells Canyon Dams. In addition, the dams' fish passage facilities, powerhouse and

spillway operations, and reduced water flows can delay the salmon. Because sockeye salmon do not feed during their upstream migration, delays during migration may deplete the salmon's limited energy reserves and increase pre-spawning mortality.

The hydroelectric dams primarily affect the Snake River juvenile sockeye salmon. The juvenile fish are killed, injured, lost, and delayed as they pass through reservoirs, turbines, spillways, sluiceways, and bypass systems. While the fish are in the reservoirs they are subjected to increased predation by such species as the northern squawfish (*Ptychocheilus oregonensis*), a native fish, and the non-native walleye (*Stizostedion vitreum*). Some salmon also lose the urge to migrate and remain in the reservoirs, while others are delayed and arrive at the ocean unable to undergo the physiological changes necessary to adapt to salt water. Although no studies have been conducted specifically on sockeye salmon, an estimated 93 percent of juvenile chinook salmon (*Oncorhynchus tshawytscha*) and steelhead are lost an-

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nually due to the eight mainstem dams. This percentage can approach 100 percent in low flow years.

Water diversion from the Columbia River and Salmon River for agricultural irrigation has contributed to the salmon's decline. Agricultural diversions have removed all of the water from Alturas Lake Creek, preventing the salmon from entering the lake they once used. Other unscreened water diversions allow juvenile fish to move into irrigation systems and become lost. Water withdrawals from the Columbia River Basin also reduce the flows during the time the juvenile salmon are migrating to the ocean, which in turn decreases the survival of the fish.

Several other factors have contributed to the decline of the salmon run. Commercial fisheries have been harvesting the Snake River sockeye salmon since 1889. In 1898, more than 4.5 million pounds (2.05 million kilograms) of sockeye salmon, including Snake River fish, was taken from the lower Columbia River. From 1960 to 1973, commercial and tribal sockeye salmon fisheries in the Columbia River downstream from the Snake River averaged 35,956 fish. These fisheries may have harvested a disproportionately high number of Redfish Lake sockeye because the Redfish Lake sockeye are relatively large compared to the Columbia River sockeye salmon. The stocking of freshwater gamefish in the reservoirs and at the spawning grounds has resulted in increased predation of the sockeye's eggs, fry, and smolt. The Snake River Basin also has been experiencing drought conditions. This has resulted in lower flows, which in turn delay the return of juvenile fish downstream and may preclude fish from moving through the dams.

If Endangered Species Act protection is extended to the Snake River sockeye salmon, the operation of the mainstem dams for power generation,

irrigation, flood control, and navigation could be affected. In particular, flows in the rivers could be modified to improve the passage of migrating juvenile sockeye. Other Federal actions that could be affected include permits issued by the Army Corps of Engineers under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act, and Federal Energy Regulatory Commission licenses for non-Federal development and operation of hydropower dams.

NMFS and the other involved Federal and State agencies could take several measures to help conserve the species. These include: capturing adult sockeye returning to Redfish Lake to spawn and using their offspring to rebuild the population; improving adult fish passage facilities at dams; eliminating the catch of sockeye salmon in all Columbia River fisheries; placing screens across all water diversions to prevent the loss of migrating juvenile

sockeye; and controlling predators and competing species in the Stanley Basin lakes.

Goldline Darter and Blue Shiner

These two fish species may have once occupied most of the Cahaba River system in Alabama and the upper Coosa and Alabama River systems in Alabama, Georgia, and Tennessee. The goldline darter (*Percina aurolineata*) is a slender fish, about 3 inches (8 centimeters) long, with brownish-red and amber stripes along its upper back. It historically occurred in 49 miles (79 kilometers) of the Cahaba River, almost 7 miles (11 km) of the Little Cahaba River, and in the Coosawattee River system (part of the upper Coosa River system). Today, it survives in fragmented populations in the Coosawattee River, in about 7 miles of the Little Cahaba River, and

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photo by Malcom Pierson

The goldline darter (*Percina aurolineata*) seems to have declined throughout the Cahaba River system. It continues to survive in about 7 miles of the Little Cahaba River, Alabama, where this specimen was found.

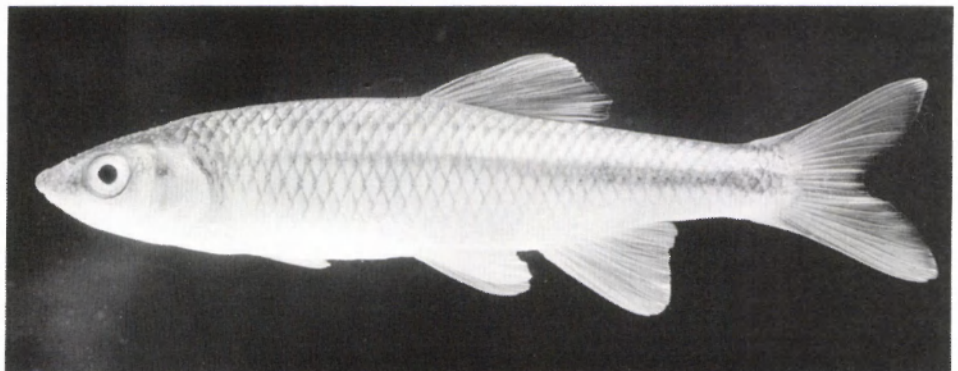


photo by Malcom Pierson

This male blue shiner (*Cyprinella caerulea*) was found in the Little River, a tributary of the Coosa River, in Alabama.

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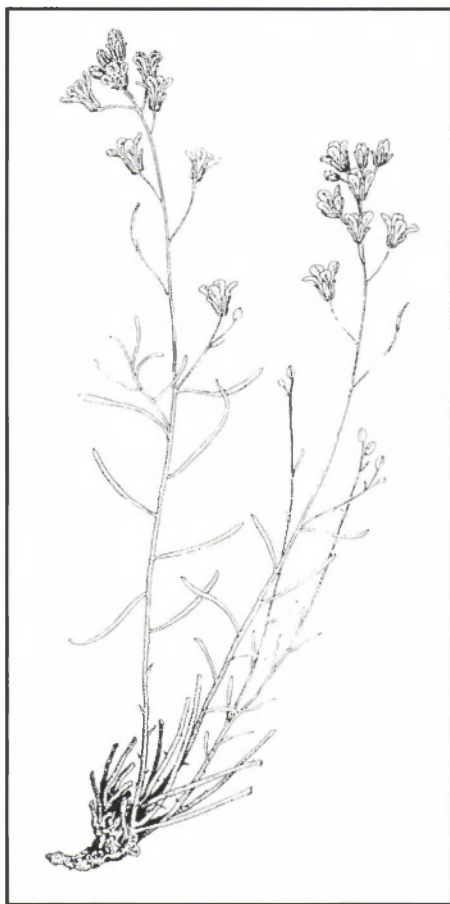
in 27 miles (43 km) of the Cahaba River.

The blue shiner (*Cyprinella caerulea*) is a medium-sized minnow that may grow up to 4 inches (10 cm) long and often appears to be dusky blue with pale yellow fins. This fish historically occurred in the Cahaba River in Alabama and the upper Coosa River system in Alabama, Georgia, and Tennessee. It has been extirpated from the Cahaba River, but continues to survive in fragmented populations in the upper Coosa River system.

The ranges of both fishes have declined due to water pollution and the construction of reservoirs. Water pollution is responsible for eliminating the blue shiner and reducing the goldline darter populations in the Cahaba River system. In this basin, there are 10 municipal wastewater treatment plants, 35 surface mining areas, and 67 other permitted discharges. During low flows, virtually all of the water in some stretches of the river is treated sewage effluent. Although some of the wastewater treatment plants have been upgraded, nutrients in the sewage are still contributing to eutrophication of the river, which adversely affects the fish by removing oxygen from the water. Increased siltation that results from surface mining, the operation of limestone quarries and cement plants, road construction, and site preparation for gas drilling operations also has degraded water quality and affected both species. Methane gas extraction in the basin also could occur in the future, which has the potential to affect water quality and the fish.

Impoundments for hydropower, navigation, and flood control probably wiped out all of the goldline darter and blue shiner populations in the upper Alabama and Coosa Rivers, along with isolated populations in the tributaries of the upper Coosa River. These reservoirs also have fragmented and isolated the goldline darter popu-

lations in the Cahaba River system from the upper Coosa River tributary populations. Because these fragmented populations are apparently reproducing, the Fish and Wildlife Service has proposed that the goldline darter and blue shiner be listed as Threatened rather than Endangered (F.R. 4/19/91).



drawing by K. H. Thorne

The Barneby reed-mustard (*Schoenocrambe argillaceae*) grows up to 12 inches (30 cm) from a woody root crown. Its inflorescence contains as many as 20 small flowers that are whitish to pale lavender in color with prominent purple veins.

Two Utah Plants

The clay reed-mustard (*Schoenocrambe argillaceae*) and Barneby reed-mustard (*Schoenocrambe barnebyi*), small perennial herbs in the family Brassicaceae, were proposed for listing in the April 12 *Federal Register*. Both species are endemic to desert shrub-lands, and each has specific soil requirements. Their low numbers and restricted distribution make them particularly vulnerable to extinction as a result of habitat disturbance.

All known populations of *S. argillaceae* are on Federal lands in southwestern Uintah County that are leased for oil and gas reserves. In addition, the species' entire range is underlain by oil shale, which could be mined when economic conditions favor it. The Bureau of Land Management (BLM) is responsible for administering energy development in this area. A total of approximately 2,000 individuals of *S. argillaceae* are known to exist at seven sites.

About the same number of *S. barnebyi* are known to remain in two small populations. One is within Capitol Reef National Park in central Wayne County. The other is on BLM-administered land on the San Rafael Swell, a large anticline or geological upwarp, in southern Emery County. This population is threatened by habitat damage associated with the potential for uranium mining. The single hillside where it occurs already has been bisected by an access road leading to nearby mining claims. Even before a mine is developed, the annual assessment work required to maintain the claims could degrade the habitat.

If the proposal to list *S. argillaceae* and *S. barnebyi* is approved, Federal agencies will be required to ensure that none of their activities (including mineral leasing) are likely to jeopardize the survival of these species.

Five Puerto Rico Plants

Five species of rare evergreen trees and shrubs endemic to the island of Puerto Rico were proposed April 19 for listing as Endangered:

- *Callicarpa ampla*, or capa rosa — A species in the family Verbenaceae, this tree grows up to 50 feet (15 meters) tall. Its branched inflorescence bears numerous small, whitish flowers. Only seven trees at four sites are known.

- *Styrax portoricensis*, or palo de jazmin — A taller tree, this member

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Callicarpa ampla



Styrax portoricensis



Ternstroemia luquillensis



Ternstroemia subsessilis

Listing Proposals

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of the family *Styracaceae* can reach 66 feet (20 m) in height. The inflorescence is a 3- to 6-flowered raceme, each flower being borne on a curved pedicel. Only one individual tree is known, and it was damaged in 1989 by Hurricane Hugo.

- *Ternstroemia luquillensis* or palo colorado — The third tree in this listing package, *T. luquillensis*, belongs to the tea family (*Theaceae*). It grows as tall as 60 feet (18 m) and produces showy, white or cream-colored flowers. Only two trees of this species have been reported in recent years.

- *Ternstroemia subsessilis* — A related species, this plant is a shrub or small tree that grows to about 17 feet (5 m) in height. Its small, white flowers are solitary and borne at the ends of the branches. A total of 24 individuals in 3 populations are known.

- *Ilex sintenisii* — The fifth species, *I. sintenisii*, is a shrub or small tree in the holly family (*Aquifoliaceae*). No specimens taller than 15 feet (4.5 m) tall have been recorded. It is restricted to the dwarf or elfin forest of the Luquillo Mountains.

All five of these species have been reduced in range and numbers, and are now believed to occur only in the Luquillo Mountains of northeastern Puerto Rico. Although the surviving

populations are within the Caribbean National Forest, road construction, expansion of communication facilities, and certain forestry management activities could threaten some of the plants. Because these species are so extremely rare, the loss of any one individual could be critical. If the listing proposal is approved, the U.S. Forest Service will be responsible under the Act for ensuring that these plants and their habitat are protected.

* * *

Available Conservation Measures

Among the conservation benefits authorized for Threatened and Endangered plants and animals under the Endangered Species Act are: protection from adverse effects of Federal activities; restrictions on take and trafficking; the requirement for the Service to develop and carry out recovery plans; the authorization to seek land purchases or exchanges for important habitat; and Federal aid to State and Commonwealth conservation departments that have approved cooperative agreements with the Service. Listing also lends greater recognition to a species' precarious status, which encourages other conservation efforts by State and local agencies, independent organizations, and concerned individuals.

Section 7 of the Act directs Federal agencies to use their legal authorities

to further the purposes of the Act by carrying out conservation programs for listed species. It also requires these agencies to ensure that any actions they fund, authorize, or carry out are not likely to jeopardize the survival of any Endangered or Threatened species. If an agency finds that one of its activities may affect a listed species, it is required to consult with the Service on ways to avoid jeopardy. For species that are proposed for listing and for which jeopardy is found, Federal agencies are required to "confer" with the Service, although the results of such a conference are not legally binding.

Additional protection is authorized by Section 9 of the Act, which makes it illegal to take or to engage in interstate or international trafficking in listed animals except by permit for certain conservation purposes. For plants, the rules regarding "take" are different. It is unlawful to collect or maliciously damage any Endangered plant on lands under Federal jurisdiction. Removing or damaging listed plants on State and private lands in knowing violation of State law or in the course of violating a State criminal trespass law also is illegal under the Act. In addition, some States have more restrictive laws of their own specifically against the take of State or federally listed plants and animals.

Final Listing Rules Published for Three Species

During April 1991, the Fish and Wildlife Service published final rules listing three taxa—a plant, a bird, and a mammal—as Threatened or Endangered species. Endangered Species Act protection is now available to the following:

Schoepfia arenaria

This small evergreen tree, a member of the family *Olacaceae*, is endemic to the coastal forests and limestone hills of northern Puerto Rico. It grows up

to 20 feet (6 meters) tall and may have several trunks up to 4 inches (10 centimeters) in diameter. Urban, industrial, and tourist development has extirpated the species from most of its range. Today, this plant is known to occur in the Isabela area (about 100 individuals), on private land near the Pinones Commonwealth Forest (about 30 mature plants and numerous saplings and seedlings), and on limestone hills in Fajardo (an estimated 50 individuals). One tree was

reported in the Rio Abajo Commonwealth Forest in 1985, and the species may also exist in the Tortuguero Lagoon Natural Reserve. Residential development threatens the population near the Pinones Commonwealth Forest. One landowner in Isabela recently proposed to donate the cliffs on which some trees grow to the Puerto Rico Department of Natural Resources. The other populations, however, are under intense development

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Final Listings

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pressure. The Fish and Wildlife Service proposed that *Schoepfia arenaria* be listed as Threatened in the September 17, 1990, *Federal Register* (see *Bulletin* Vol. XV, No. 10), and the final rule was published April 19, 1991.

White-necked Crow (*Corvus leucognaphalus*)

This bird resembles the crows of the mainland United States but is distinguished by the pure white base of the feathers of the hind neck. It originally occurred in the Dominican Republic, Haiti, Puerto Rico, and St. Croix in the U.S. Virgin Islands. The white-necked crow seems to thrive only where there are extensive stands of natural forest. With the clearing of the forests and extensive hunting of the bird for its meat, the crow has disappeared from St. Croix and Puerto Rico.

Today, the white-necked crow only occurs in limited parts of the Dominican Republic and Haiti, which share

the island of Hispaniola. However, the bird's remaining forest habitat is being cleared for agriculture, housing, and tourist development. It is estimated that less than 7 percent of Haiti and less than 15 percent of the Dominican Republic remains forested. In addition, the crow continues to be hunted in the Dominican Republic. The Service proposed that the white-necked crow be listed as Endangered in the December 27, 1989, *Federal Register* (see *Bulletin* Vol. XV, No. 1), and the final rule was published April 3, 1991.

Silver Rice Rat (*Oryzomys palustris natator*)

The Lower Keys population of the rice rat, or the silver rice rat, is a small rodent endemic to the wetlands of Florida's Lower Keys. Rice rats occur from the southeastern United States and Mexico to northern South America. There are varying interpretations regarding the taxonomic status of those in the Lower Keys. However, the Service has determined that they do constitute a distinct vertebrate

population and therefore are eligible for Endangered Species Act protection.

The silver rice rat requires undeveloped mangrove forests and salt marsh habitat, unlike the common rats (*Rattus* spp.) found in urban areas. Most of this natural habitat in the lower Florida Keys has been lost during the past few decades because of commercial and residential development. The silver rice rat is currently known to occur at very low densities on eight keys. It is believed extirpated from one key and possibly from two others. The silver rice rat's remaining habitat continues to be threatened by residential and commercial development. In addition, predation by raccoons (*Procyon lotor*) and competition with introduced black rats (*Rattus rattus*) threaten the survival of the silver rice rat. The Service proposed in the October 20, 1990, *Federal Register* that the lower Florida Keys population of the rice rat be listed as Endangered (see *Bulletin* Vol. XV, No. 11), and the final rule was published April 30, 1991.

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in recommending that areas known to be used by breeding gray wolves (*Canis lupus*) be closed to coyote (*Canis latrans*) hunting during the big game hunting season, and that baiting and the use of hounds to hunt black bear (*Ursus americanus*) in the Selkirk Grizzly Bear Recovery Zone be prohibited. The Service supported the recommendation to temporarily restrict coyote hunting because it believes there is the potential for hunters to mistake young wolves for coyotes. The Washington Department of Wildlife will implement the recommendations in the State's regulations for the next three hunting seasons.

* * *

On March 20, a Service biologist found tracks of two wolves and an elk (*Cervus elaphus*) carcass the wolves had

recently killed in Idaho's upper St. Joe River drainage. The area is about 7 miles (11 kilometers) from the Montana-Idaho line and has had frequent gray wolf sightings for the past 10 years. This reconfirms that wolves are present in this portion of Idaho.

* * *

The Threatened Warner sucker (*Catostomus warnerensis*) occurs only in a few lakes and streams in Oregon's Warner Valley. The survival of this fish may now be imperiled as water conditions in the valley decline due to a continuing drought. A recent fish kill in Crump Lake included nearly 100 Warner suckers. This summer, Hart Lake is expected to dry up. In light of these conditions, personnel from the Oregon Department of Fish and Wildlife, the Bureau of Land Management, The Nature Conservancy, and the Service began to capture the remaining lake-dwelling fish

in April, when the species is most easily captured. Tentative arrangements have been made to move the fish to Dexter National Fish Hatchery, New Mexico, where they will be temporarily held until conditions improve in Warner Valley.

* * *

Since 1980, the Institute for Wildlife Studies in Arcata, California, in cooperation with the California Department of Fish and Game, has been conducting a program to reintroduce bald eagles (*Haliaeetus leucocephalus*) on Santa Catalina Island, California. However, the reintroduced eagles' eggs have not been successfully hatching due to residual DDE contamination.

To help increase the Santa Catalina Island population, biologists from the Service's Sacramento Field Office and the California Department of Fish and

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Game removed two bald eagle eggs from a mainland nest at Frenchman Reservoir (Plumas County) and escorted the eggs on a commercial flight from Reno, Nevada, to Long Beach. The following day, the eggs were placed into two nests on Santa Catalina Island. They successfully hatched in mid-April.

The California Department of Fish and Game intends to treat Frenchman Reservoir with a fish poison to destroy an illegally introduced population of northern pike (*Esox lucius*), which poses a serious threat to the entire Sacramento/San Joaquin Valley fishery should the pike escape or be transported from the reservoir. Translocating the bald eagle eggs prevented possible mortality of juvenile eagles due to loss of their food supply, while helping restore the Santa Catalina Island eagle population.

* * *

The Service released a draft environmental assessment on April 15 for proposed additions to the Julia Butler Hansen National Wildlife Refuge in the Westport, Oregon, area. This refuge protects important habitat for two subpopulations of the Endangered Columbian white-tailed deer (*Odocoileus virginianus leucurus*). Securing habitat to protect a third viable population in the Westport area is one of the key remaining steps in the species' recovery plan. In the draft environmental assessment, the Service is proposing to purchase title to approximately 1,600 acres (650 hectares) of key habitat and obtain conservation easements and cooperative agreements for an additional 2,900 acres (1,200 ha).

* * *

The Service also has begun preparing a draft environmental assessment to establish a refuge in the southernmost end of San Diego Bay, California. The San Diego Bay National Wildlife Refuge would protect habitat for a variety of endangered wildlife,

including the California least tern (*Sterna antillarum browni*), light-footed clapper rail (*Rallus longirostris levipes*), brown pelican (*Pelecanus occidentalis californicus*), peregrine falcon (*Falco peregrinus*), and bald eagle. The study area consists of approximately 2,500 acres (1,000 ha) owned by the Port of San Diego, State of California, San Diego Gas and Electric, and Western Salt Company. Over 80 percent of the original tidal wetlands of this bay have already been lost to development, and commercial and recreational development is a threat to the remaining habitat. Numerous environmental organizations and public agencies have indicated support for the refuge.

* * *

Region 2 - The Calgary Zoo in Alberta, Canada, is completing plans for its whooping crane (*Grus americana*) rearing facility. The zoo, which is scheduled to receive its first whooping crane eggs in 1992, is eventually expected to contain up to 10 breeding pairs of whoopers. Young birds that are produced and reared at the Calgary Zoo will be used to help establish new populations in the wild. To help ensure successful propagation of the cranes, two zoo employees will receive one month of special avicultural training at the International Crane Foundation in Baraboo, Wisconsin. Later, they will visit the Service's Patuxent Wildlife Research Center in Laurel, Maryland, for further orientation. The zoo also expects to raise other crane species this year in order to gain experience in caring for and breeding cranes.

Nine whooping cranes — five juveniles, one subadult, two adult females, and an adult male — disappeared from the Aransas National Wildlife Refuge in Texas this winter and are presumed dead. The loss of nine birds represents 6.1 percent of the population and is the worst winter loss since 1962 when 12.5 percent of the population was lost. Nine other adult and subadult birds disappeared

between the spring of 1990, when the birds departed for Canada's Wood Buffalo National Park, and the fall, when they arrived back at Aransas. With only 13 juvenile whoopers reaching the refuge in 1991, the Aransas/Wood Buffalo population's total losses exceeded production in 1990—the first time since 1981 that the population has declined.

Six of this winter's losses likely occurred in a 4-mile (6-km) stretch of the refuge in late December and early January. Although the remnants of only one carcass have been found, predation is suspected in some of the losses. Three of the juveniles had winter territories adjacent to the 4-mile stretch and all five juveniles fed in the area. The female parent of one of the juveniles is also among those presumed dead.

Two other subadults are also missing. Subadults move about more frequently than adults during the winter months and do not maintain a territory. The two cranes were last seen together in February and may have moved outside of the area being surveyed.

As the 1991 spring migration began, a whooper was shot and killed near Bend, Texas. A suspect signed a confession and charges are pending. The maximum population in the Wood Buffalo/Aransas flock is now 136 birds, compared to 142 birds at this time in 1990.

* * *

Region 3 - Since 1980, the Service has been providing Endangered Species Act grants for surveys, land acquisition, and other conservation activities intended to protect "algific talus slopes" in the Driftless Area of Iowa, Minnesota, Wisconsin, and Illinois. This area was not glaciated during the last ice age, unlike the surrounding region where glacial deposits (drift) are common, and it has unique topographic and biological features such as the algific talus slopes. These steep slopes, underlain with fissures and

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caves, are covered with talus or rock rubble. Cold, moist air flows out of the fissures and percolates through the rubble, providing unique habitat conditions. The Endangered Iowa Pleistocene snail (*Discus macclintocki*), the Threatened northern wild monkshood (*Aconitum noveboracense*), and at least eight plant and invertebrate listing candidate species are found on these slopes.

The Service has been working closely with the four States, The Nature Conservancy, several Iowa County conservation boards, numerous biologists, and cooperative landowners to identify and protect these fragile areas and their rare species. As a result of the exceptional cooperative efforts of these organizations and individuals, a substantial number of important algific slopes are now owned and protected by The Nature Conservancy, the States of Minnesota, Iowa, and Wisconsin, and the Service.

To monitor the rare species' populations and habitat conditions on the algific slopes in Iowa, including some still in private ownership, the Service's Region 3 biologists are developing a cooperative monitoring program. Funding for this effort is being provided by The Nature Conservancy, the Iowa Department of Natural Resources, and the Service (using both Section 6 grants and plant recovery funding). Each of the organizations will contribute one or more individuals to the monitoring team to ensure that data are collected consistently. The team will be trained by experienced algific slope researchers in the proper techniques to safely sample these species. After the team works as a unit to sample a few algific slopes, it will separate and its members will monitor several areas spread across a seven-county region in northeastern Iowa. Some sites will be simply monitored using photographs, while others will undergo detailed demographic analysis or mark-recapture

studies. Eventually, the Service hopes to expand this monitoring program into all important algific slopes throughout the Driftless Area.

* * *

Region 4 - For 5 years, Aquatic Specialists, a private company in Knoxville, Tennessee, that breeds and rears tropical fishes, has been conducting a captive-rearing project for the Endangered smoky madtom (*Noturus baileyi*) and Threatened yellowfin madtom (*Noturus flavipinnis*) in cooperation with the University of Tennessee's Department of Zoology. The Tennessee Wildlife Resources Agency has funded the project using Endangered Species Act grants from the Service. The project involves collecting eggs and larvae of both species from Citico Creek in the Cherokee National Forest, Tennessee, rearing them in captivity, returning captive-reared juveniles to Citico Creek to augment that population, and reintroducing fish into Abrams Creek in Great Smoky Mountains National Park. Captive populations of the fishes have also been established for breeding purposes.

To date, 1,191 smoky madtom and 1,288 yellowfin madtom eggs and larvae have been collected. Some mortality has occurred, but 535 smoky madtom and 378 yellowfin madtom juveniles have been reintroduced into Abrams Creek; 37 smoky madtoms and 80 yellowfin madtoms have been returned to Citico Creek; and 37 smoky madtoms and 12 yellowfin madtoms have been kept for captive breeding. Last spring, an adult smoky madtom was seen guarding a nest cavity in Abrams Creek—the first sign that the madtom reintroduction effort may be succeeding. Fish in the captive population are healthy, but breeding has not yet occurred.

In April, the University of Tennessee's Zoology Department hosted the annual recovery meeting for the two listed fishes. Some attendees expressed concern that the yellowfin madtom population in

Citico Creek may have declined significantly because of droughts and floods in recent years. Fortunately, however, no decline in the smoky madtom population has been evident. The U.S. Forest Service is funding a survey to assess the population levels of both species before any additional eggs or larvae are taken. Abrams Creek also will be surveyed this spring for spawning madtoms. In addition, the Forest Service is seeking funding to survey other streams for potential reintroduction sites, primarily in the Little Tennessee drainage.

* * *

Region 5 - The Nature Conservancy, the town of Brookhaven, New York, and the Service have set up a cooperative agreement for the protection and management of a sandplain gerardia (*Agalinis acuta*) population on Long Island. This highly vulnerable site has been threatened by a road widening project and was disturbed during the installation of a pipeline. With support from the Service's New York Field Office, the town has fenced the area where the plants are located to protect them from further disturbance.

* * *

For the past several months, the Service's Virginia Field Office has been sponsoring meetings with local, State, and Federal agencies, along with private interests, to increase the understanding and protection of jeopardized mussel and fish species occurring in the Upper Tennessee River Basin of southwestern Virginia. Several ad hoc interagency work groups, comprised of 16 private groups and governmental agencies, are now developing mechanisms to protect the listed species and improve water quality in the river basin.

* * *

Over 60 volunteers participated in West Virginia Cliffwatch 1991, an effort to monitor returning peregrine falcons in the State. Two breeding pairs were located in 1991, both in

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the Monongahela National Forest. Additional peregrines have been observed, but no other pairs have been confirmed. As of April 16, one of the two pairs appeared to be incubating eggs. This is the first documented nesting of peregrine falcons in West Virginia since 1949.

* * *

Region 6 - Ten new nesting islands for the Endangered interior least tern (*Sterna antillarum*) and the Threatened piping plover (*Charadrius melodus*) are being created in the Platte River in Nebraska. The Platte River Whooping Crane Habitat Maintenance Trust, the National Audubon Society's Lillian Annette Rowe Sanctuary, and the Fish and Wildlife Service cooperated to construct two of the islands last summer. These islands will be available for shorebirds returning to nest in 1991. Another eight nesting islands will be built in the river this summer by the Nebraska Public Power District. The utility is doing this work to satisfy a Federal Energy Regulatory Commission condition in its annual license to operate Kingsley Dam.

The Lyman-Richey Corporation of Omaha, Nebraska, also announced a \$24,000 donation to the Nebraska Game and Parks Commission's nongame and endangered wildlife conservation fund to increase efforts to protect the least tern and piping plover. The National Fish and Wildlife Foundation will provide additional funds to match the company's donation. The contributions will be used by the State to hire personnel to monitor the birds while they are nesting at the company's sand and gravel mining sites along the Loup and Platte Rivers, to increase public awareness, and to provide advice to the sand and gravel operators to protect the birds.

Historically, interior least terns and piping plovers were common breeding birds along the rivers of the northern

Great Plains. The barren to sparsely vegetated sand and gravel pits closely resemble the river sandbars where the birds nest and raise their young. However, much of the birds' breeding habitat has been eliminated through the damming, channelization, and diversion of the Platte River. Efforts are now under way to protect the remaining riverine habitat and to curtail human disturbance during the breeding season.

Through its donation, the Lyman-Richey Corporation hopes to serve as a catalyst for conservation elsewhere along the two rivers. The company plans to work closely with other sand and gravel operations through the Nebraska Concrete Aggregates Association, a nonprofit organization of the sand and gravel industries, to promote conservation of terns and plovers.

* * *

The Utah Division of Wildlife Resources has succeeded in breeding Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*) in a small reservoir in Utah's Pilot Mountains. The Threatened Lahontan cutthroat trout is native to the Humboldt River drainage in Nevada. Water diversions are primarily responsible for the decline of the species and its habitat.

To propagate the species, State and Service biologists captured Lahontan cutthroat trout in a small stream north of Wendover, Utah, and released the trout into the reservoir in the Pilot Mountains in 1986 and 1987. The fish have exhibited phenomenal growth in this reservoir. This spring, two ripe females and one male weighing between 5 and 6 pounds (2.3 - 2.7 kilograms) were caught and artificially spawned. Seven thousand eggs from the females are being incubated. The fry will be placed in a small nursery pond to optimize their growth and development. Some of the juvenile fish will then be put back into the reservoir to augment that population, while others may be released into other suitable habitat in Utah.

* * *

The Utah Division of Wildlife Resources has stocked Endangered June suckers (*Chasmistes liorus*) in Camp Creek Reservoir. Recently, 15 to 20 immature June suckers were found, indicating that there may be natural reproduction and some recruitment occurring in the reservoir.

In addition to the Camp Creek Reservoir project, the State is planning to launch a major effort to breed June suckers from Utah Lake. There is no documented recent survival of young suckers in the lake because it is full of introduced, predacious fish. Adult fish will be taken out of the Provo River, which they enter to spawn, between mid-May and mid-June. Progeny from these fish will be maintained at the Utah Division of Wildlife Resources' Fisheries Experimental Station at Logan and the Fish and Wildlife Service's Ouray National Wildlife Refuge. These fish will be maintained as broodstock for future research and reintroduction programs.

To provide an alternative food source for the large population of predatory fish in Utah Lake, the State is considering the possibility of introducing gizzard shad (*Dorosoma cepedianum*). However, the State first will study the potential for competition between the gizzard shad and the June sucker before introducing any shad into the lake.

* * *

The fate of four "orphaned" gray wolf pups in the Nine-mile Valley in Montana continues to be of special interest to many people (see *Bulletin* Vol. XVI, No. 3). The Service had hoped that the pups would stay away from livestock. Ranchers in the area cooperated with the Service and wrote a letter to all livestock producers requesting that they properly dispose of livestock carcasses in order to avoid wolf depredations.

However, in late March the wolves left the Nine-mile Valley and killed two yearling steers. Due to the likeli-

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hood for continued depredation on livestock, Service biologists believed it was necessary to capture the wolves and transfer them to Glacier National Park. The biologists were successful in capturing only three of the pups, one male and two females, because one of the pups recovered from the tranquilizer before it could be restrained. This pup has not returned to the Nine-mile area. However, another unrelated female wolf moved from Glacier National Park into the Nine-mile Valley in March.

The three pups were temporarily held at a veterinary clinic in Kalispell, Montana. One of the captured females was confirmed as being pregnant. This is the first documented pregnancy of an 11-month-old wolf in the wild.

On April 13, the pups were released into Glacier National Park. The pups did not stay together after they were released. The non-pregnant female left the park, and on May 25 killed two sheep in the adjacent Blackfoot Indian Reservation. She was recaptured that same day and will be transferred to the Wolf Haven in Tenino, Washington, which will permanently care for her. The male pup remains near the release site. The pregnant wolf has left the park and is now in the Bob Marshall Wilderness Area. As of May 30, there was no indication that she had settled at a den site or given birth. The Service will continue to monitor the status of the two wolves.

* * *

Region 8 - Six pairs of Endangered Puerto Rican parrots (*Amazona vittata*) have nested at five sites in the wild this year—a record. Two nests in one area have two young each, which at last report were ready to fledge. A third pair of parrots in the same valley successfully hatched two eggs but the chicks subsequently developed health problems. One of the chicks became sick with an unknown illness and was

taken to the Luquillo Aviary where it subsequently died. The other chick fledged prematurely, injured itself, and was taken to the aviary. This chick is now doing well with the captive flock.

A fourth pair of parrots nested in a new area and is believed to have one chick. This nesting area had been modified by the Forest Service to attract Puerto Rican parrots. The fifth nesting site has 3 eggs, of which at least one has hatched (at last report) and is believed to be doing well. The sixth nesting area, which is also a new nest area, is believed to have a female incubating eggs.

If these parrots are successful in fledging their young, significant progress will have been made in the recovery effort. The presence of two new nesting areas in the wild is of special significance. Biologists from the Fish and Wildlife Service and the Forest Service have been trying to establish new nesting areas for over 10 years. There are now at least 20 parrots in the wild and 56 in captivity.

* * *

Intensive trapping this past winter at Buenos Aires National Wildlife Refuge in Arizona documented the presence of 28 coveys of Endangered masked bobwhites (*Colinus virginianus ridgwayi*), totaling more than 200 birds. Biologists actually trapped about 90 of the birds, of which 9 percent were estimated to have been produced on the refuge based on the absence of leg bands.

* * *

Region 9 - On April 15, the Environmental Protection Agency requested formal consultation with the Service on the effects of 31 pesticides (15 wildlife control agents, 15 insecticides, 1 herbicide) on listed species, as required under section 7 of the Endangered Species Act. The pesticides will be reviewed for possible impacts to every potentially affected Threatened and Endangered species in the United States (approximately 600). This program is designed to bring

EPA's pesticide registration activities into compliance with the environmental protection provisions of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). A National Consultation Team, comprised of biologists from each of the Service's seven regions, is handling the consultation. A final biological opinion is anticipated by mid-December.

* * *

Staff from the Service's Office of Management Authority represented the United States at the April 8-11 meeting of the Standing Committee of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The Standing Committee is CITES' governing body between biennial meetings of the Conference of the Parties. It is composed of representatives of North America, Latin America and the Caribbean, Asia, Oceania, Africa, and Europe, along with Switzerland (where the CITES Secretariat is located) and Japan (the host of the next CITES meeting in 1992). Canada is the current North American representative to the Standing Committee; the United States attended the meeting as an observer.

The Standing Committee discussed several issues at the April meeting. South Africa requested that its African elephant (*Loxodonta africana*) population be transferred from Appendix I to Appendix II of CITES. (Appendix I prohibits trade for primarily commercial purposes, while Appendix II allows for regulated trade.) At the seventh meeting of the CITES Conference of Parties in 1989, the Parties agreed to a special mechanism for transferring some populations of the African elephant back to Appendix II if a series of criteria are satisfied (see *Bulletin* Vol. XV, No.5). In response to South Africa's request, the CITES Standing Committee established a panel of six experts to review the proposal, including its biological, trade, and law enforcement implications.

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The panel's report will be considered at the March 1992 Conference of Parties in Kyoto, Japan.

Another topic the CITES Standing Committee addressed was Thailand's trade in fauna and flora. There is concern that Thailand is involved in a significant amount of illegal trade, which is undermining CITES and posing a serious threat to many endangered species. The Standing Committee subsequently decided to recommend that the CITES Parties prohibit any trade with Thailand in fauna and flora covered by CITES. The Service is evaluating options for addressing this Standing Committee recommendation.

The Standing Committee also examined a report on illegal trade from Grenada, particularly its trade in psittacine birds from Guyana and Brazil. The Standing Committee will monitor the situation in Grenada, which is not a CITES Party, before making any additional recommendations. The Service has offered to assist the CITES Secretariat in providing assistance to Grenada so it can join and implement the treaty.

In addition, the Standing Committee agreed, at the request of the Ser-

BOX SCORE

LISTINGS AND RECOVERY PLANS

Category	ENDANGERED		THREATENED		LISTED SPECIES TOTAL	SPECIES WITH PLANS
	U.S.	Foreign Only	U.S.	Foreign Only		
Mammals	55	249	8	22	334	31
Birds	73	153	12	0	238	67
Reptiles	16	58	18	14	106	25
Amphibians	6	8	5	0	19	6
Fishes	53	11	33	0	97	49
Snails	4	1	6	0	11	7
Clams	38	2	2	0	42	30
Crustaceans	8	0	2	0	10	5
Insects	11	1	9	0	21	12
Arachnids	3	0	0	0	3	0
Plants	190	1	60	2	253	126
TOTAL	457	484	155	38	1134*	358**

Total U.S. Endangered457(267 animals, 190 plants)

Total U.S. Threatened155(95 animals, 60 plants)

Total U.S. Listed612(362 animals, 250 plants)

* Separate populations of a species that are listed both as Endangered and Threatened are tallied twice. Those species are the leopard, gray wolf, grizzly bear, bald eagle, piping plover, roseate tern, Nile crocodile, green sea turtle, and olive ridley sea turtle. For the purposes of the Endangered Species Act, the term "species" can mean a species, subspecies, or distinct vertebrate population. Several entries also represent entire genera or even families.

** There are 286 approved recovery plans. Some recovery plans cover more than one species, and a few species have separate plans covering different parts of their ranges. Recovery plans are drawn up only for listed species that occur in the United States.

Number of Cooperative Agreements signed with States and Territories:53 fish & wildlife
39 plants

Number of Cooperative Grant Agreements signed for the African Elephant Conservation Act:7

Number of CITES Party Nations:110

May 31, 1991

vice, to place the issues of trade in sea turtles and wild birds on the provi-

sional agenda for the 1992 CITES meeting.

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